

CLAIMS

What is claimed is:

- 1 1. An abrasive recovery apparatus for use with the slurry generated by water jet
2 cutting or conditioning operations, the slurry comprised of non-recyclable fines and
3 recyclable particles, the apparatus comprising:
4 a slurry intake system providing a self-clearing nozzle and orifice for
5 recovery of slurry;
6 a separator for selectively separating recyclable abrasive particles from
7 non-recyclable fines; and
8 a fluidized bed dryer to dry the recyclable particles for reuse in the water
9 jet cutting operation.
- 1 2. The abrasive recovery apparatus of claim 1 wherein the separator further
2 comprises one or more filters.
- 1 3. The abrasive recovery apparatus of claim 1 wherein the separator further
2 comprises a screen brush for dislodging agglomerated slurry.
- 1 4. The abrasive recovery apparatus of claim 1 wherein the separator is a shaker table.
- 1 5. The abrasive recovery apparatus of claim 1 further comprising a control circuit to
2 control the activation of the fluidized bed dryer.
- 1 6. The abrasive recovery apparatus of claim 1 further comprising a thermocouple
2 disposed within the fluidized bed dryer to control the activation of the fluidized bed dryer.
- 1 7. An abrasive recovery apparatus for use with the slurry generated by water jet
2 cutting or conditioning operations, the slurry comprised of non-recyclable fines and
3 recyclable particles, the apparatus comprising:
4 a slurry intake system for providing a self-clearing nozzle ejecting water at
5 a first rate and an orifice collecting water and slurry at a second and higher rate for
6 the recovery of slurry, the slurry intake system having one or more pumps for
7 moving the slurry through the self-clearing nozzle and orifice and intermittently
8 providing back flow to dislodge agglomerated slurry;

9 a separator downstream for receiving the recovered slurry and separating
10 recyclable abrasive particles from non-recyclable fines, separator having a shaker
11 filter agitated by a vibrator and shaker table; and

12 a dryer comprising a drying chamber and heating elements.

1 8. An abrasive recovery apparatus for use in conjunction with the slurry generated by
2 water jet cutting or conditioning operations, the slurry comprised of non-recyclable fines
3 and recyclable particles, the abrasive recovery apparatus comprising:

4 a slurry intake system for distributing collected slurry, the slurry intake
5 system having a sump pump, a nozzle-orifice arrangement, and a diaphragm
6 pump, the sump pump for passing the water into the nozzle-orifice arrangement
7 for the collection of slurry into the diaphragm pump, the diaphragm pump for
8 forcing the slurry downstream from the sump pump and for intermittently
9 providing back flow through the nozzle-orifice arrangement to dislodge slurry
10 agglomerated at the opening to the nozzle-orifice arrangement;

11 a vibrating separator downstream from the diaphragm pump for receiving
12 the slurry and separating the non-recyclable fines from the recyclable particles, the
13 vibrating separator having a distributor, a shaker filter, a waste spout, a recycle
14 spout, a vibrator, and a shaker table, the distributor being a shallow pan for
15 receiving and distributing the slurry to the shaker filter, the shaker filter having
16 one or more screens to remove non-recyclable fines from the slurry and pass
17 through the waste spout, the shaker filter further passing the recyclable particles
18 through the recycle spout, the shaker filter further having a plurality of screen
19 brushes to agitate the slurry and prevent clogging upon action by the vibrator and
20 shaker filter; and

21 a fluidized bed dryer comprising a drying chamber, heating elements and a
22 final product spout, the drying chamber for receiving the recyclable particles from
23 the recycle spout, the heating elements for drying the recyclable particles, and the
24 final product spout for delivering dried recycled particles.

1 9. The abrasive recovery apparatus of claim 8 further comprising a control circuit for
2 selectively energizing the heating elements.

- 1 10. A method for recovery of dried abrasive from a water jetting operation comprising
2 the steps of:
3 receiving slurry from an abrasive water jetting operation;
4 selectively pumping the slurry to a separator;
5 separating selected abrasive slurry particles; and
6 washing and drying the selected abrasive particles.
- 1 11. A method of recovering slurry from a sump comprising the steps of:
2 receiving and moving slurry through a nozzle-orifice arrangement;
3 providing intermittent backflow through the nozzle-orifice arrangement to
4 dislodge agglomerated slurry.
- 1 12. The method of claim 11 additionally comprising the step of agitating the slurry
2 around the nozzle-orifice arrangement to dislodge agglomerated slurry.
- 1 13. A method of filtering cuttings from metal substrates, the cuttings comprising
2 recyclable grit, metal, and non-usable grit, the method comprising the steps of:
3 recovering cuttings from metal substrates;
4 separating the recyclable grit from the metal and non-usable grit;
5 drying the metal and non-usable grit; and
6 separating the metal from the non-usable grit.